CLAIMS:

1.   A method of processing digital mobile communications network data for analysis, the method comprising:

inputting network data captured from a digital mobile communications network, said network data comprising data for a plurality of communications sessions over said network, said network data including a plurality of session related parameters;

inputting query data for one or more queries, a query defining a statistic relating to one or more of said parameters, to be computed from said network data;

formatting a said query to define said statistic in terms of one or more intermediate statistics relating to said one or more parameters and to be computed from said network data, said statistic being computable from one or more sets of said one or more intermediate statistics;

operating with said formatted query on said captured network data to determine said one or more intermediate statistics;

storing said intermediate statistics in a data store for analysis.

2.   A method as claimed in claim 1 wherein said storing comprises storing said one or more of said intermediate statistics relating to said one or more parameters indexed by said one or more parameters.

3.   A method as claimed in claim 1 or 2 further comprising organising said captured network data by communications session prior to operating with said formatted query.

4.   A method as claimed in claim 3 wherein said storing comprises storing said intermediate statistics indexed by an identifier of a said communications session.

5.   A method as claimed in claims 3 or 4 wherein said organising comprises dividing said captured network data into a plurality of data structures, one for each said communications session; and wherein said operating with said formatted query comprises operating on each said data structure to determine said intermediate statistics.

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6.   A method as claimed in claim 5 wherein said storing includes storing an identifier of a said data structure.

7.   A method as claimed in claim 5 or 6 wherein said operating comprises providing said captured network data for a communications session to a data pipe configured to store a time-ordered series of sets of entries, one for each of said one or more parameters, and reading parameters at a time position on said data pipe for a said formatted query.

8.   A method as claimed in any preceding claim wherein said data store comprises a database, the method further comprising determining a configuration for said database using said inputted query data.

9.   A method as claimed in any preceding claim further comprising analysing data in said data store, said analysing comprising:
        inputting selection data defining selected ones of said one or more parameters;
        reading said intermediate statistics for said related parameters; and
        determining at least one said statistic for said related parameters from said intermediate statistics.

10.   A method as claimed in claim 9 wherein said selection data comprises marketing or customer service report data.

11.   A system for processing digital mobile communications network data for analysis, the system comprising:
        means for inputting network data captured from a digital mobile communications network, said network data comprising data for a plurality of communications sessions over said network, said network data including a plurality of session related parameters;
        means for inputting query data for one or more queries, a query defining a statistic relating to one or more of said parameters, to be computed from said network data;

means for formatting a said query to define said statistic in terms of one or more intermediate statistics relating to said one or more parameters and to be computed from said network data, said statistic being computable from one or more sets of said one or more intermediate statistics;

means for operating with said formatted query on said captured network data to determine said one or more intermediate statistics;

means for storing said intermediate statistics in a data store for analysis.

12.   A query formatting code module, in particular for the system of claim 11, the code module comprising computer program code to, when running:

input query data for one or more queries, a query defining a statistic relating to one or more parameters of a digital mobile communications network communications session, to be determined from data captured from said communications network; and

format a said query to define said statistic in terms of one or more intermediate statistics relating to said one or more parameters and to be computed from said network data, said statistic being computable from one or more sets of said one or more intermediate statistics.

13.   A carrier carrying the code module of claim 12.

14.   A digital mobile communications network data analysis code module, in particular for the system of claim 11, the code module comprising computer program code to, when running:

read one or more intermediate statistics for a query relating to one or more parameters of a digital mobile communications network communications session, said query defining a statistic to be determined from data captured from said communications network and computable from one or more sets of said one or more intermediate statistics; and

determine said statistic from said one or more sets of said one or more intermediate statistics.

15.   A database including the code module of claim 14.

16.   A carrier carrying the code module of claim 14.

17.   A method of processing digital mobile communications network data for analysis, the method comprising:

          inputting network data captured from a digital mobile communications network, said network data comprising data for a plurality of communications sessions over said network, said network data including a plurality of session related parameters;

          dividing said captured network data into a plurality of data structures, one for each said communications session;

          processing said divided data in accordance with one or more queries to generate statistical data for each of a plurality of said sessions, said query defining at least one statistic relating to one or more said parameters;

          storing, in a data store, said statistical data for each of said sessions in association with a session identifier;

          whereby network data for a session used to generate said statistical data is retrievable .

18.   A method as claimed in claim 17 wherein said statistical data comprises statistical data aggregatable to provide said at least one statistic for a combination of two or more said sessions.

19.   A method as claimed in claim 17 or 18 wherein said processing comprises operating on each said data structure to generate said statistical data.

20.   A method as claimed in claim 17, 18 or 19 wherein said storing comprises storing indexed by one or more of said parameters.

21.   A method as claimed in any one of claims 17 to 20 wherein said processing is performed in parallel for said plurality of data structures.

22.   A system for processing digital mobile communications network data for analysis, the system comprising:

means for inputting network data captured from a digital mobile communications network, said network data comprising data for a plurality of communications sessions over said network, said network data including a plurality of session related parameters;

means for dividing said captured network data into a plurality of data structures, one for each said communications session;

means for processing said divided data in accordance with one or more queries to generate statistical data for each of a plurality of said sessions, a said query defining at least one statistic relating to one or more of said parameters; and

means for storing, in a data store, said statistical data for each of said sessions in association with a session identifier;

whereby network data for a session used to generate said statistical data is retrievable.

23.   A system as claimed in claim 22 wherein said statistical data comprises data for intermediate statistics, said system further comprising:

means for inputting query data defining said one or more queries;

means for formatting a said query to define a said statistic in terms of one or more intermediate statistics relating to said one or more parameters and to be computed from said network data, said statistic being computable from one or more sets of said one or more intermediate statistics;

means for operating with said formatted query on said captured network data to determine said one or more intermediate statistics; and

means for storing said intermediate statistics in said data store for analysis.

24.   A system as claimed in claim 22 or 23 further comprising a plurality of processors, each said data structure having an associated processor to perform said processing and to send said statistical data for a session over a network to said data store.

25.   A code module for the system of claim 22, the module comprising computer program code to, when running:

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input network data captured from a digital mobile communications network, said network data comprising data for a plurality of communications sessions over said network, said network data including a plurality of session related parameters; and

divide said captured network data into a plurality of data structures, one for each said communications session.

26.   A code module for the system for claim 22, the module comprising computer program code to, when running:

process captured network data in accordance with one or more queries to generate statistical data for each of a plurality of communications sessions in said network data, a said query defining at least one statistic relating to one or more of parameters of messages in said captured data; and

store in a data store said statistical data for each of said sessions in association with a session identifier;

whereby network data for a session used to generate said statistical data, is retrievable.

27.   A carrier carrying the code of claim 25 or 26.

28.   A system for parallel processing digital mobile communications network data for analysis, the system comprising:

a plurality of data processors each configured to input network data for one of a plurality of concurrent communication sessions captured from a digital mobile communication network and to operate on said session data to generate statistical data; and

a database, coupled to said plurality of data processors, to store said statistical data for analysis.

29.   A system as claimed in claim 28 wherein each of said data processors has an associated file store configured to store data for a said communications session.

30.   A system as claimed in claim 28 or 29 wherein said statistical data is generated by a query defining at least one statistic relating to one or more parameters associated with a said communications session.

31.   A system as claimed in claim 30 further comprising a query definition code module to send a said query to each of said data processors.

32.   A system as claimed in claim 30 or 31 wherein said statistical data is aggregatable to provide said at least one statistic for a combination of two or more of said sessions.

33.   A system as claimed in claim 32 further comprising an output code module to read said statistical data for a plurality of said sessions, to aggregate said read statistical data, and to provide said aggregated data for output.

34.   A system as claimed in any of claims 29 to 33 further comprising a splitter to input said captured network data, to divide said input data into data for separate communication sessions, and to write said split data into said communication session file stores.

35.   A system as claimed in claim 34 wherein said splitter further comprises a protocol stack decoder to decode a protocol stack of said communications network for dividing said captured data into communications sessions.

36.   A system as claimed in claim 34 wherein said splitter further comprises a data pipe, said data pipe being configured to store time ordered message data representing parameters decoded from messages in said captured network data; a session tracker, attached to said data pipe at a first position, to read said message data and write session identification data for said messages into said data pipe; and a session exporter, attached to said data pipe at a second, later position, to read said message data and said session identification data and to export said message data to a session data file store selected according to said session identification data.

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37.   A system as claimed in any of claims 28 to 34 further comprising means to capture said network data from said communications network.

38.   A system as claimed in any one of claims 28 to 37 further comprising a report generator coupled to said database and configured to generate a report from said statistical data, said report including data aggregated over a plurality of said communications sessions.

39.   A data splitter for dividing data captured from a digital mobile communications network comprising data for a plurality of communications sessions into data for separate communication sessions, said data splitter comprising:

        an input to receive said captured network data;

        a protocol stack decoder to decode a protocol stack of said captured network data and provide message data for said plurality of communication sessions;

        a data pipe, coupled to said protocol stack decoder, said data pipe being configured to store said message data in time order;

        a session tracker to write session identification data into said pipe responsive to said message data; and

        a session exporter to read said message data and said session identification data and to export said message data to a session data file store selected according to said session identification data.

40.   A data splitter as claimed in claim 39 wherein said session tracker is attached to said data pipe at a first position, and wherein said session exporter is attached to said data pipe at a second, later position.

41.   A computer system including the data splitter of claim 39 or 40.

42.   A data carrier carrying computer program code to implement the data splitter of claim 39 or 40.

43.   A system for generating a report on a digital mobile communications network, the report comprising statistical data derived from an aggregation of data relating to

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measurements characterising performance of the network for individual users, the system comprising:

    a data capture device to capture data from an interface of the network;

    a data processor to process said captured data to generate statistical data relating to individual data communication sessions using said network; and

    a report generator to input said statistical data and generate a said report.

44.   A system as claimed in claim 43 further comprising a data splitter to divide said captured network data into data for separate communication sessions for processing by said data processor.

45.   A system as claimed in claim 43 or 44 wherein said statistical data is generated by a query defining at least one statistic relating to one or more parameters associated with a said communications session.

46.   A system as claimed in claim 45 wherein said statistical data is aggregatable to provide said at least one statistic for a combination of two or more of said sessions.

47.   A system as claimed in any one of claims 43 to 46 wherein said report is user definable.

48.   A system as claimed in claim 47 wherein said report comprises a marketing report.

49.   A system as claimed in claim 47 wherein said report comprises a user quality of service report.

50.   A carrier carrying computer program code to implement the system of any one of claims 43 to 49.

51.   A method or system, code module, code or carrier as claimed in any preceding claim wherein said communications network comprises a digital mobile phone network.

52.   Computer program code to, when running, implement the method of any one of claims 1 to 10 and 17 to 21.

53.   A carrier carrying the computer program code of claim 52.